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09/615,794	07/13/2000	Dong-Gyu Kim	06192.0141.NPUS00	5256

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EXAMINER

RUDE, TIMOTHY L

ART UNIT PAPER NUMBER

2871

DATE MAILED: 06/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/615,794

Applicant(s)

KIM, DONG-GYU

Examiner

Timothy L Rude

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-51 is/are pending in the application.
- 4a) Of the above claim(s) 5-7, 16-18 and 25-51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 9, 11-13, 15 and 20-24 is/are rejected.
- 7) ☒ Claim(s) 8, 14 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claims

1. Claim 10 is canceled. Claims 1, 2, 4, 8, 9, 11, 13-15, 19, and 23 are amended.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 9, 11-13, 15, and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukada et al (Tsukada) USPAT 4,955,697 in view of Dohjo et al (Dohjo) USPAT 5,646,756.

As to claims 1-3, Tsukada discloses in Figure 10 his fourth embodiment (col. 8, lines 38-62) a liquid crystal display, comprising:

a first insulating substrate;

a plurality of gate lines, 3, formed at the first substrate to transmit scanning signals;

a plurality data lines, 1, crossing over the gate lines to transmit picture signals;

a second insulating substrate facing the first substrate;

a liquid crystal layer injected into the gap between said first insulating substrate and said second insulating substrate;

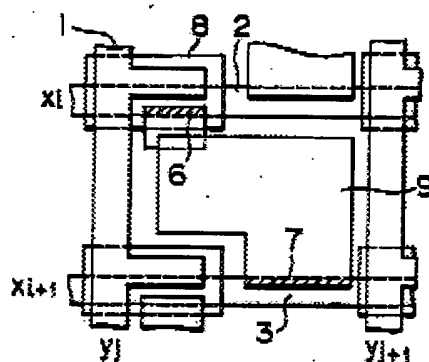
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a pixel demarcated by the gate lines and the data lines (per Figure 10), the gate lines demarcating the pixels into rows, and the data lines demarcating the pixels into columns;

a pixel electrode, 9, formed at each pixel; and

a storage capacitor, 7, formed between said pixel electrode and the previous gate line (col. 6, lines 40-48).

FIG. 10



Tsukada does not explicitly disclose a black matrix defining each pixel; wherein an opening ratio of each pixel at the first pixel row is different from the opening ratio of the pixels at the other pixel rows.

Dohjo teaches, in Figures 6 and 5, the use of a protecting film, 23 (Applicant's black matrix), wherein an aperture ratio is lowered in the peripheral portions of the display near the sealant and near the closing agent (Applicant's opening ratio of each pixel at the first pixel row is different from the opening ratio of the pixels at the other pixel rows) to prevent the development of deterioration of image quality of the peripheral

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portions while preventing a lowering of the aperture ratio of the main display pixel electrodes (col. 9, line 58 through col. 10 line 5).

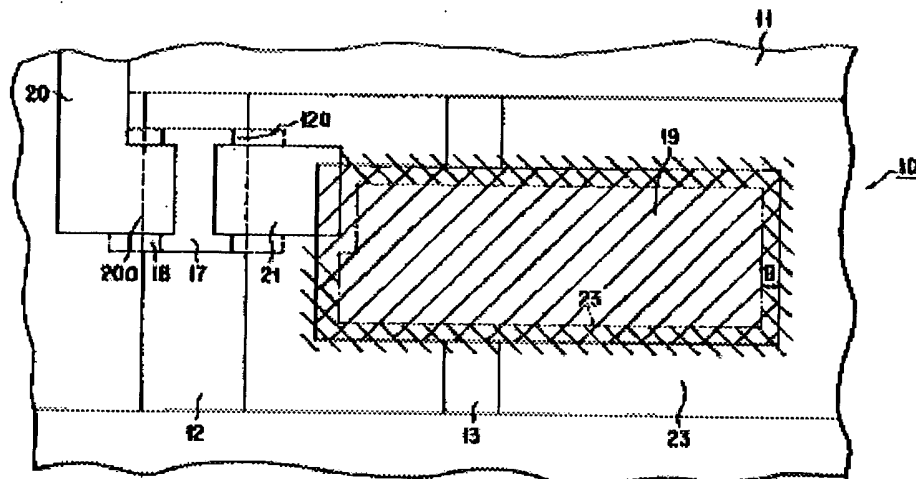


FIG. 6

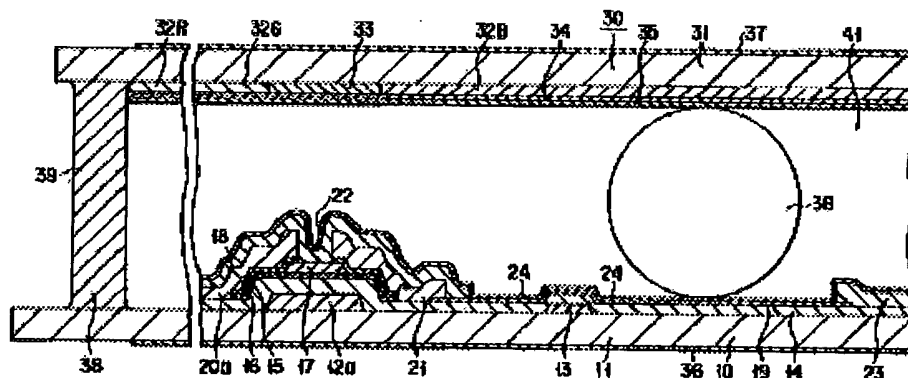


FIG. 5

Dohjo is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a black matrix, wherein an opening ratio of

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each pixel at the first pixel row is different from the opening ratio of the pixels at the other pixel rows to prevent the development of deterioration of image quality of the peripheral portions while preventing a lowering of the aperture ratio of the main display pixel electrodes.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Tsukada with the black matrix of Dohjo, wherein an opening ratio of each pixel at the first pixel row is different from the opening ratio of the pixels at the other pixel rows to prevent the development of deterioration of image quality of the peripheral portions while preventing a lowering of the aperture ratio of the main display pixel electrodes.

As to claim 4, mere formation of the black matrix at the second substrate is a commonplace configuration in the art of liquid crystals and is considered an obvious species variation of the claimed invention, not patentably distinct. If applicant does not agree, a restriction might be appropriate.

As to claims 9 and 11-12, Tsukada discloses in Figure 10 his fourth embodiment (col. 8, lines 38-62) a liquid crystal display, comprising:

a first insulating substrate;

a plurality of gate lines, 3, formed at the first substrate to transmit scanning signals;

a plurality data lines, 1, crossing over the gate lines to transmit picture signals;

a second insulating substrate facing the first substrate;

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a liquid crystal layer injected into the gap between said first insulating substrate and said second insulating substrate;

a pixel demarcated by the gate lines and the data lines (per Figure 10), the gate lines demarcating the pixels into rows, and the data lines demarcating the pixels into columns;

a pixel electrode, 9, formed at each pixel; and

a storage capacitor, 7, formed between said pixel electrode and the previous gate line (col. 6, lines 40-48);

a dummy gate line (Applicant's storage capacitor line) formed on said first insulating substrate parallel to the gate line (col. 11, lines 45-68), the storage capacitor line overlapping the pixel electrodes at the first pixel row;

a first storage capacitor formed between said pixel electrode and the previous gate line;

and, a second storage capacitor, 7, formed between said pixel electrode and said storage capacitor line;

wherein a gate-off voltage is applied by connecting to the last gate line (col. 11, lines 59-61).

Tsukada does not explicitly disclose a black matrix defining each pixel; wherein an opening ratio of each pixel at the first pixel row is different from the opening ratio of the pixels at the other pixel rows.

Dohjo teaches, in Figures 6 and 5, the use of a protecting film, 23 (Applicant's black matrix), wherein an aperture ratio is lowered in the peripheral portions of the display near the sealant and near the closing agent (Applicant's opening ratio of each

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pixel at the first pixel row is different from the opening ratio of the pixels at the other pixel rows) to prevent the development of deterioration of image quality of the peripheral portions while preventing a lowering of the aperture ratio of the main display pixel electrodes (col. 9, line 58 through col. 10 line 5).

Dohjo is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a black matrix, wherein an opening ratio of each pixel at the first pixel row is different from the opening ratio of the pixels at the other pixel rows to prevent the development of deterioration of image quality of the peripheral portions while preventing a lowering of the aperture ratio of the main display pixel electrodes.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Tsukada with the black matrix of Dohjo, wherein an opening ratio of each pixel at the first pixel row is different from the opening ratio of the pixels at the other pixel rows to prevent the development of deterioration of image quality of the peripheral portions while preventing a lowering of the aperture ratio of the main display pixel electrodes.

As to claims 13 and 15, mere formation of the black matrix at the second substrate is a commonplace configuration in the art of liquid crystals and is considered an obvious species variation of the claimed invention, not patentably distinct. If applicant does not agree, a restriction might be appropriate.

As to claims 20-22, Tsukada discloses connection of the storage capacitor line to the last gate line (col. 11, lines 59-61) (Applicant's further comprising a gate-off line formed on said first substrate to transmit a gate-off voltage, wherein the gate-off line and said storage capacitor line are formed at the same layer as the gate line, wherein the gate-off line and said storage capacitor line are electrically connected to each other via a connection member, and the connection member is formed at the same layer as the data line or said pixel electrode).

As to claims 23 and 24, Tsukada discloses a functional liquid crystal display with driving circuitry and voltage driving scheme (col. 11, lines 61-66) (Applicant's further comprising gate signal transmission films arranged at said first substrate and provided with a gate driving integrated circuit that is electrically connected to the gate lines and outputs gate driving signals, and data signal transmission films arranged at said first substrate and provided with a data driving integrated circuit that is electrically connected to the data lines and outputs data driving signals, wherein a common electrode wire for applying the common electrode voltage (V_{com}), a gate-on wire for applying the on-voltage V_{on} to the TFTs controlling the picture signals, a gate-off wire for applying the off-voltage V_{off} , and wires for transmitting carry-in or gate-clock signals are formed on the edge portion of the first substrate between the gate signal transmission film and the data signal transmission film, wherein the common electrode wire, the gate-on wire, and the gate-off wire at the same layer as the gate lines with the same material).

Allowable Subject Matter

3. Claims 8, 14, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 8, relevant prior art of record did not disclose, alone or in combination, the liquid crystal display of claim 2, wherein the opening ratio of the first pixel row is designed to be *60-80% of the opening ratio* of the other pixel rows. The closest combination is Tsukada in view of Dohjo, but they do not explicitly disclose the claimed range of 60-80%.

As to claim 14, relevant prior art of record did not disclose, alone or in combination, the liquid crystal display of claim 13, wherein opening width of said black matrix at the first pixel row in the *longitudinal direction of the gate line is identical* to opening width of said black matrix at the other pixel rows. The closest combination is Tsukada in view of Dohjo, but they do not explicitly disclose an opening width of said black matrix at the first pixel row in the longitudinal direction of the gate line is identical to opening width of said black matrix at the other pixel rows.

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As to claim 19, relevant prior art of record did not disclose, alone or in combination, the liquid crystal display of claim 11, wherein the opening ratio of the first pixel row is designed to be *60-80% of the opening ratio* of the other pixel rows. The closest combination is Tsukada in view of Dohjo, but they do not explicitly disclose the claimed range of 60-80%.

Response to Arguments

4. Applicant's arguments filed on 11 April 2003 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

(1) Tsukada in view of Dohjo does not explicitly disclose an opening ratio of each pixel at the first pixel row is different from the opening ratio of the pixels at the other pixel rows.

(2) To establish *prima facie* obviousness of a claimed invention, all the claim limitation must be taught or suggested by the prior art.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that Dohjo teaches the use of reducing the aperture ratio at the perimeter of the display area to prevent deterioration of the image quality without lowering the aperture ratio of the main display area per rejections above. Please note that in considering the disclosure of a reference, it is proper to take into

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account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom (MPEP 2144.01).

Examiner maintains that it would have been obvious to those of ordinary skill in the art of liquid crystals at the time the claimed invention was made to reduce the aperture ratio at any peripheral location, e.g., first row, first column, last row, etc., in order to prevent any unwanted light leakage regardless of cause. In other words, whenever light leakage is experienced along any edge of the display region, it would be obvious to stop down the affected pixels by reducing their aperture ratio, given Tsukada in view of Dohjo.

(2) It is respectfully pointed out that Tsukada in view of Dohjo teaches the reduction of the aperture ratio of the first row of pixels relative to the pixels in the main display area (Applicant's other pixel rows). The claims are in comprising format, so the fact that Dohjo teaches reduction of the aperture ratio of other pixels in addition to the first row of pixels does not prevent Tsukada in view of Dohjo from reading on the claims as broadly written.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



TLR
June 16, 2003

Timothy L Rude
Examiner
Art Unit 2871



ROBERT H. KIM
SUPERVISOR
TECHNOLOGY CENTER 2800